The Contribution of ANILCA to Alaska's Economy

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1. Introduction and Background

This paper presents an assessment of the economic contribution of ANILCA and ANILCA-protected ecosystems to Alaska's economy. I consider the links between the conservation units designated by the Act and a healthy Alaska economy. The paper consists largely of synthesis and application of existing data and research. It does not consider global ecosystem services or other values that are not currently captured within the Alaska economy.

ANILCA was a one-time "natural experiment." It is not possible, therefore, to observe how the Alaska economy would have evolved absent ANILCA. This makes it difficult if not impossible to say that the Act itself "caused" much of anything. Instead, the best we can do is to say that the data are consistent – or inconsistent -- with certain broad hypotheses and conclusions.

It is not the purpose of the paper to pass judgment on whether ANILCA was good or bad. Instead, I hope to add some facts and concepts to improve the discussion about how to make ANILCA work better and how to increase the benefits from ANILCA lands in the future. All of the important questions about ANILCA are about the future, not the past.

The paper proceeds as follows. The remainder of this section reviews how ANILCA created new conservation units and what Congress' stated intentions were with respect to economic development. Section 2 provides a brief look at some relevant economic theory that can help frame any analysis of ANILCA-economy linkages. Section 3 reviews the meager literature on these linkages. In section 4 I add some additional analysis of relevant data. Section 5 concludes with some speculation about the role of ANILCA lands in Alaska's future.

1.1. How did ANILCA allocate lands?

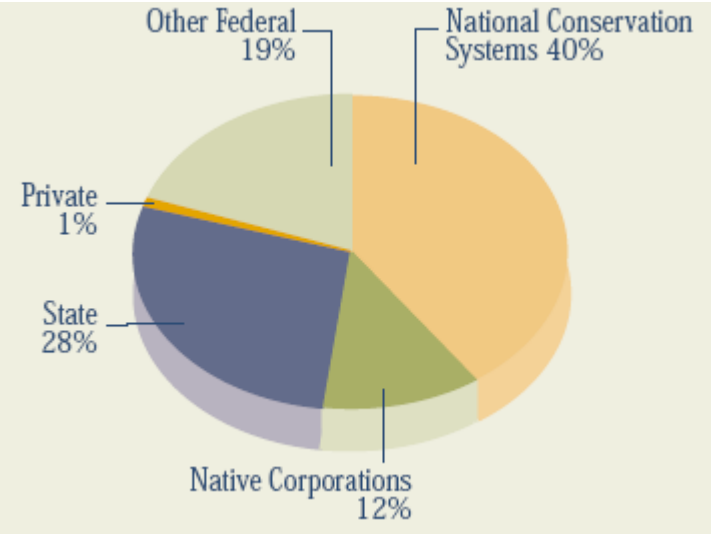
ANILCA added 104 million acres to the nation's system of conservation units as shown in Table 1. Prior to ANILCA, the Alaska Statehood Act had allocated 104 million acres to the State of Alaska and the Alaska Native Claims Settlement Act (ANCSA) had allocated 44 million acres to Alaska Native corporations. Figure 1 shows the resulting allocation of Alaska's 375 million acres. ANILCA added most land in the form of new national wildlife refuges. The second most important category of additions was new national parks.

Table 1
Federal lands before and after ANILCA
(millions of acres)

	Before ANILCA	ANILCA	Other Changes	Today
national parks and preserves	**7.5**	**43.7**		**51.2**
new		37.9		37.9
existing	7.5	5.8		13.3
national wildlife refuges	**18.7**	**54.2**	**3.9**	**76.8**
new		26.6		
existing	18.7	27.6		
national forests	**22.0**	**3.4**		**22.0**
other		**2.2**		**2.2**
total	**48.2**	**103.5**		**152.2**
designated Wilderness				57.8

source: Hull and Leask 2000; Roberts et al. 2003; USDA Forest Service, US Fish and Wildlife Service

Figure 1
Alaska land allocations, circa 2000



source: reproduced from Hull and Leask 2000.

1.2. How did ANILCA attempt to promote economic progress?

Section 101 of ANILCA declares the intent of Congress as follows:

§101. (a) In order to preserve for the benefit, use, education and inspiration of present and future generations certain lands and waters in the State of Alaska that contain nationally significant natural, scenic, historic, archeological, geological, scientific, wilderness, cultural, recreational, and wildlife values, and units described in the following titles are hereby established.

(b) It is the intent of Congress in this Act to preserve unrivaled scenic and geological values associated with natural landscapes; to provide for the maintenance of sound populations of, and habitat for, wildlife species of inestimable value to the citizens of Alaska and the Nation, including those species dependent on vast relatively undeveloped areas; to preserve in their natural state extensive unaltered arctic tundra, boreal forest, and coastal rainforest ecosystems, to protect the resources related to subsistence needs; to protect and preserve historic and archeological sites, rivers, and lands, and to preserve wilderness resource values and related recreational opportunities including but not limited to hiking, canoeing fishing, and sport hunting, within large arctic and subarctic wildlands and on freeflowing rivers; and to maintain opportunities for scientific research and undisturbed ecosystems.

(C) It is further the intent and purpose of this Act consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for which each conservation system unit is established, designated, or expanded by or pursuant to this Act, to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so.

(d) This Act provides sufficient protection for the national interest in the scenic, natural, cultural and environmental values on the public lands in Alaska, and at the same time provides adequate opportunity for satisfaction of the economic and social needs of the State of Alaska and its people; accordingly, the designation and disposition of the public lands in Alaska pursuant to this Act are found to represent a proper balance between the reservation of national conservation system units and those public lands necessary and appropriate for more intensive use and disposition, and thus Congress believes that the need for future legislation designating new conservation system units, new national conservation areas, or new national recreation areas, has been obviated thereby.

source: ANILCA section 101, obtained from http://www.r7.fws.gov/asm/anilca/toc.html

At the risk of oversimplification, it is possible to summarize the above purposes as: (1) preserve intact ecosystems, wildlife, and associated recreational values; (2) provide for the continuation of subsistence; and (3) provide adequate economic opportunity for Alaska.

In the attempt to balance preservation with economic opportunity in the extractive industries, Congress took some care to avoid putting certain resources off limits to development. This was done in three broad ways. First, several known areas of high mineral resource potential were excluded from designation as conservation lands. As Leask (1985, p 25) stated:

> In the end, when Congress passed the 1980 Alaska lands act, it excluded most of the major known [mineral] deposits from conservation areas, but in some cases, the deposits are surrounded by or are near conservation lands.

Second, Congress made liberal use of two flexible land classifications – national preserves and wildlife refuges – that allowed for a higher degree of multiple use management than parks, while retaining the preservation of biotic resources as the essential purpose. Third, numerous so-called "Alaska exceptions" were created to the prevailing rules governing land management. These exceptions basically were meant to ensure the continuation of the pre-existing lifestyles and economic opportunities available to Alaskans, notably including subsistence, existing mining claims, and the development of ANCSA lands.[1]

Notably absent from the statement of intent is any mention of promoting healthy commercial fisheries or tourism as industries dependent in part on intact ecosystems. Today fishing and tourism are Alaska's two largest employers (Colt 2001, Pardes 2004). At the time of ANILCA, however, America faced an energy crisis and the petroleum industry dominated Alaska's economy. In summary, then, ANILCA sought to preserve lands while allowing adequate access for subsistence and extraction. ANILCA was not proposed to be an economic development tool.

2. Economic Theory and ANILCA

Four strands of economic theory are particularly relevant to any consideration of ANILCA and the Alaska economy. These are: (1) The theory of common property; (2) the portfolio approach to land management; (3) the scarcity theory of value; (4) the theory of production. All four concepts relate to the idea of "economic efficiency," which simply means maximizing the net economic benefits from Alaska's lands and resources over time.

2.1. ANILCA clarified property rights - somewhat

All Americans commonly own the federal public domain lands. These lands have many attributes of an economic "commons" in which valuable resources are allocated – if at all -- on a short-term and ad-hoc basis by administrative regulation. Economic theory predicts that as the

[1] Roberts (2003) contains an excellent discussion of the Alaska exceptions contained in ANILCA.

demands on the commons increase, the resulting outcome will be inefficient: net economic benefits will not be maximized because those who can make the most valuable long-term use of the resources will lack the incentives or the legal or physical ability to do so. In particular, capital investment – including investment in conservation and stewardship -- is stifled and short-term exploitation is encouraged. Resources are also wasted fighting over who should get the current economic pie rather than devoted to making the pie bigger for the future.

ANILCA can be viewed as an attempt to clarify the property rights to some of the Alaska commons in the same way that the Statehood Act and ANCSA did. By establishing new conservation units with specific purposes, Congress created clearer rules of the game for managers, investors, and consumers. After ANILCA, tourism operators and mineral developers alike could now proceed to pursue their investments and business plans with far greater certainty.

2.2. ANILCA implemented a portfolio approach to land management

Economic theory can be used to show that, in general, benefits are maximized when multiple activities are carried out on the same land. For example, it would make no sense to allow only caribou hunting in southcentral Alaska and only moose hunting in the Interior. Game resources would be wasted and people would travel needlessly from one region to the other in search of variety.

However, there are circumstances under which this theory breaks down.[2] These circumstances arise when there are strong interactions, or externalities, between different activities on the same piece of ground. Noise pollution is a good example. To the tourist seeking solitude, the marginal "cost" of noise from the first helicopter is very high. A second or third helicopter may not add any *additional* aggravation if all three appear together. Under these circumstances it is intuitively clear that there is less overall disruption when the helicopters are concentrated – either in time or in one area – than when they are spread out all over the landscape and/or the day.

An approach to land management that concentrates some uses in space or in time is known as a portfolio approach. Distinct areas are allocated to distinct uses. Overall, a diverse mix of activities is supported. In contrast, the "pure" theory of multiple use seeks to allow or

[2] Technically, these are referred to as nonconvexities. Under nonconvex conditions, the marginal cost of the first unit of output can exceed the marginal benefit, so it does not make economic sense to produce any units of the good.

promote many different activities in the same place and at the same time. Both the portfolio approach and multiple use *can* maximize economic benefits under some circumstances. The trick is to apply the correct tool for the management job at hand.

ANILCA articulated specific uses for specific areas of Alaska lands. In particular, designated Wilderness[3] was created to assure that in some places the benefits of solitude, silence, and natural heritage would not be diminished. As mentioned above, Congress also designated millions of acres as wildlife refuges with more flexible management regimes. Overall, the portfolio of Alaska lands became more diverse and individual units were designated to "specialize" in the production of certain kinds of goods and services.

2.3. ANILCA lands are scarce and growing scarcer

Historian Roderick Nash (1982, p. xii) noted a distinct turning point in attitudes toward wild places that he dates to about 1890:

> According to the census, the American frontier officially ended in 1890. After that, the scarcity theory of value began to work on behalf of wilderness. Gradually increasing numbers of Americans came to see wilderness as an asset rather than a liability…

One might ask exactly what Nash meant by the "scarcity theory of value." Not everything that is scarce is thereby valuable. Both bear sightings and bear maulings are rare in Alaska. Scarcity applies to what economists call the "supply side" of the economic situation. However, the demand for a resource is equally important.[4] The scarcity theory of value is really about the scarcity of supply *relative to demand*.

ANILCA preserved lands the supply of which was, and is, growing more scarce on a national or global scale. At the same time, the national and global demand for the wildness of these lands is rising with increases in population, income, and (some would argue) awareness. Thus, the scarcity theory of value does apply to ANILCA lands, and it implies that the economic value of conservation system units will rise steadily over time.

If the scarcity theory of value applies, why did so many Alaskans oppose ANILCA? The answer is that ANILCA lands are not scarce *to Alaskans.* Instead, what Alaskans typically perceive as scarce are jobs and income. More parks and more Wilderness are superfluous

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[3] I use the word Wilderness with a capital "w" to refer to official designations under the 1964 Wilderness Act.

[4] In a famous passage from his "Principles of Economics," circa 1890, Alfred Marshall invoked the idea that the "twin scissors" of supply and demand jointly determine value in the marketplace.

annoyances to many Alaskans, just as more traffic and more "civilization" are unwelcome to millions of people who live elsewhere.

One is tempted to conclude that economic theory almost *requires* that the national interest and the local interest in land protection and management be utterly different and in perpetual conflict. Indeed, it seems that many people did make this conclusion when forming opinions during the political battles prior to 1980. However, it is possible to reconcile the two basic perceptions of scarcity through economic exchange. If Alaskans can package, provide, and sell "wildness" to the world, they can create value for the buyers and jobs and income for themselves.

2.4. ANILCA lands are just one of many inputs to production

The economic theory of production reminds us that several inputs must be combined to produce a marketable output. A fine dining experience depends on excellent ingredients, a skilled and creative chef, a pleasant and comfortable atmosphere, and good service. Lurking behind the scenes is a healthy dose of management and entrepreneurship that melds the other inputs together at just the right moments. And, equally important, all of the inputs must be available at a combined cost that is less than the market price of the product.

Why is production theory relevant to the economics of ANILCA? The main reason is that ANILCA lands and resources (such as healthy wildlife populations) are only one input to the production of goods and services – whether they be minerals, fish, or wildlife tours. Designating the Quartz Hill molybdenum deposit as available for extraction was not sufficient to ensure a viable mine. Nor were the restrictions on access to the deposit imposed by ANILCA a deal-breaker. The high production costs relative to low molybdenum prices have played a major role in stifling the development (so far) of the Quartz Hill mine (Leask 1985).

Similarly, the profitable production of Alaska tourism products can be linked to ANILCA lands and perhaps to the "designation effect" of creating new parks and Wilderness. But other factors, such as proximity to population and capital infrastructure, have also played a key role in the growth of tourism. ANILCA designations, protections, and exceptions must be viewed as "necessary but not sufficient" for economic production, jobs, and income.

2.5. Questions raised by the theory

The four strands of economic theory raise four key questions about ANILCA and its effect on the Alaska economy. These questions may be useful to keep in mind while reviewing the evidence presented below.

1) Did ANILCA effectively clarify the "rules of the game" within the Alaska commons so that economic activity can proceed with reasonable certainty for business and reasonable flexibility for land managers acting on the public's behalf?

2) Did ANILCA generate a good portfolio of different land designations to promote tourism and recreation, allow extraction of high-value commodities, and safeguard subsistence?

3) Are we taking proper account of the long-term benefits from increasingly valuable ANILCA resources?

4) What other inputs can or must be combined with ANILCA lands and resources to maximize economic benefits, and who should provide those inputs?

3. Relevant Literature on ANILCA and the Alaska Economy

3.1. General literature on the benefits of preservation

Despite numerous optimistic assertions about the economic benefits of nature preservation[5] there have been very few quantitative assessments of the *incremental* benefits of additional preservation, additional biodiversity, or additional protections afforded by designation.

Weiler and Seidl (2004) made a head-on attempt to isolate and assess the so-called "designation effect" from changing eight national monuments to national parks in the continental U.S. They are particularly interested in the question of whether park status resulted in increased use, and whether that increased use came at the expense of visits to other nearby units. They assert that "Public lands designations, in particular national monuments and parks, signal the significance and likely character of the potential visitors' experience, and thus may have substantial effects on visitation." (p. 245). Weiler and Seidl have sufficient data to isolate and determine the park designation effect through statistical analysis. They find that the designations

[5] Balmford et al. (2002) provides a useful overview and list of references.

increased visitation by about 3% with no corresponding decrease in visitation to other federal units.

Loomis (1999) considered the designation of additional Wilderness areas within national parks and national forests. He found that a 1% increase in Wilderness acreage within national forests led to a 0.9% increase in visitation to national forest Wilderness overall. A 1% increase in Wilderness acreage within national parks led to only a 0.6% increase in visitation to national park Wilderness. These findings, while intriguing, must be interpreted with some caution, since the authors defined a "net increase" to be an overall increase in the use of *Wilderness* areas rather than an overall increase in recreation on *public lands*.

Naidoo and Adamowicz (2005) considered the effect of increased biodiversity on nature-based tourism demand in Uganda. As the authors point out, "If nature-based tourism is to be an effective means of conserving biodiversity, tourists' behaviour must lead to elevated revenues for areas rich in biodiversity." Naidoo and Adamowicz used a reasonably reliable choice experiment method to isolate the effect of biodiversity on willingness to pay, independent of other factors such as proximity, landscape, lodging amenities, etc. The authors found that a fourfold increase (from 20 to 80) in the number of bird species likely to be seen caused revenue per customer to more than double.

3.2. ANILCA and the Seward economy

Goldsmith and Martin (2001) used a time-series approach to assess the effect of the ANILCA-designated Kenai Fjords National Park on the growth of the economy of Seward, Alaska. The Seward Chamber of Commerce currently describes the community as the "Gateway to Kenai Fjords National Park,"[6] but prior to ANILCA there was significant opposition to establishment of this new park.

Goldsmith and Martin found a number of indications that the tourism industry grew rapidly throughout the 1980s and sustained the economy through the 1990s:

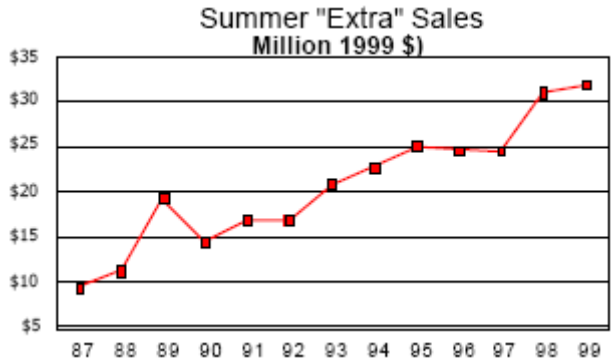
> In fact since ANILCA the Seward economy has expanded and strengthened. Annual average employment has increased at a rate of 3.7 percent per year [compared to a State of Alaska average of 2.6 % per year]. The economy has become less dependent on the unstable harvesting and processing of seafood and timber. Through the 1980s the seafood and

[6] http://www.seward.net/chamber/index1.htm as of July 5, 2005. This is the second sentence on the main Chamber of Commerce page.

timber industries did expand, but their economic contributions to the community have fallen in the 1990s. The opening of a state prison in 1988 added another source of stable employment and income.

Most of the economic growth, particularly since 1990, has been driven by the visitor industry. Although there is no direct way to track this industry, employment in trade, services, and transportation—the sectors that provide the most visitor-related jobs—grew at an annual rate of 5.9 percent. Retail sales from summer visitors have grown at a 9.9 percent annual rate (inflation adjusted) since 1987. (p. 1)

Figure 2
Seward taxable summer sales



source: Goldsmith and Martin 2001.

Writing in the *Anchorage Daily News,* Medred (2005) provides a compelling rendition of this success story:

The park came anyway, and it transformed Seward.

The economic boom that city fathers has hoped to see spawned by resource exploitation came, instead, in the form of people lining up to pay to engage in resource admiration.

Oldow and her husband, Don, were among the first to take advantage. They founded Kenai Fjords Tours to move tourists beyond Resurrection Bay into the new national park's most scenic waters: Aialak Bay, Holgate Arm and Northwestern Fjord.

Oldow remembers the first reaction to this idea:

"Someone said, 'That's a super fun idea, Pam. Where are you going to get the people?' "

From almost everywhere, as it turned out. From Anchorage and Seattle and Chicago. From Oregon and Kansas and Massachusetts. From England and France and Australia and increasingly now from elsewhere around the Pacific Rim.

When the National Park Service first started counting visitors to Kenai Fjords National Park in 1982, there were 16,000. By 1997, the number had climbed to 300,000. Since '97, it has remained in the range of 240,000 to 300,000 visitors a summer.

A 2001 study by Scott Goldsmith and Stephanie Martin at the Institute of Social and Economic Research at the University of Alaska Anchorage concluded park tourism is a $52 million-a-year business for Seward.

More than half the employment in the community, the study said, comes from transportation, trade and services related to tourism.

3.3. Healthy ecosystems and the Alaska economy

Colt (2001) assembled data from numerous sources to show that about 84,000 Alaska jobs depended directly on intact ecosystems as of 1998. Table 2 summarizes these findings. For each economic activity with commercial components, economic significance is measured by direct jobs, total jobs (after economic multiplier effects), and the total income associated with total jobs. Commercial fishing and tourism are the largest sources of jobs and income that depend in large measure on healthy ecosystems. Together, these two industries support almost 60,000 total Alaska jobs and more than $1.6 billion of total income to Alaskan workers. Sport fishing and government resource management are next in importance, each supporting about 10,000 total Alaska jobs. Sport hunting, wildlife viewing, and other resident recreation together support another 13,000 jobs. Subsistence activities require substantial commercial inputs; the provision of these inputs supports almost 2,000 jobs in the cash economy.

It is possible to add all of these categories together after some adjustments for double counting. Almost 55,000 direct jobs (full time equivalent basis) and 84,000 total FTE jobs are closely linked to the health of Alaska's ecosystems. These jobs produce almost $2.6 billion of income for Alaska workers. When compared to total 1998 Alaska employment of about 317,000 FTE jobs, the 84,000 total jobs makeup more than 26 percent of all Alaska jobs. The 55,000 direct jobs amount to six times the number of direct petroleum jobs and more than twice the employment of the petroleum, mining, and construction industries combined.[7]

[7] This calculation based on 1998 direct employment of 8,870 petroleum, 1,580 mining, and 13,430 construction as reported in Goldsmith 2000a.

Table 2
Summary of the Economic Importance of Alaska Ecosystems

Economic Activity or Ecosystem Service	Economic Significance			Net Economic Value	
	Direct Alaska Jobs (avg annual)	Total Alaska Jobs (avg annual)	Total Income ($ million)	Low Estimate ($ million)	High Estimate ($ million)
Management and Stewardship Effort	4,534	10,475	527	Not Applicable	
Commercial Fishing & Processing	19,928	33,669	1,011	192	360
Sport Fishing	6,635	9,236	233	215	215
Sport Hunting (note 1)	2,160	2,987	75	23	23
AK Resident Wildlife Viewing (note 1,2)	3,615	4,896	123	17	37
Tourism (notes 1,3)	16,871	25,512	643	not yet fully quantified	
AK Resident Other Nonconsumptive Recreation (notes 1,4)	3,615	4,896	123	not yet fully quantified	
Subsistence Harvests (note 5)	1,978	1,978	61	0	1,700
Existence Value	Not Applicable			309	29,652
Life Support Benefits	Not Applicable			1,200	1,628
Adjustments for Double-counting	(4,356)	(9,450)	(238)		
Adjusted Total	**54,980**	**84,200**	**2,559**	**1,957**	**33,615**

notes:
(1) Total income for sport hunting, resident wildlife viewing, and tourism is estimated using the income to jobs ratio for sport fishing
(2) Wildlife viewing jobs and income based on primary purpose trips and secondary purpose trips. Net economic value low estimate based on primary purpose trips; high estimate includes secondary purpose trips
(3) Tourism industry includes nonresident sportfishing and sport hunting and hence double-counts some of the jobs and income reported for those activities.
(4) Lower bound estimate
(5) Subsistence-related jobs are cash jobs related to providing commercial inputs to subsistence

Colt also found that subsistence activities generate potentially large amounts of net value to participants, ranging up to $1.7 billion. (Net value, in this case, is the additional amount of money compensation that subsistence participants would have to be compensated in order to voluntarily give up the activity). By contrast, the net economic value of commercial fisheries, sport fishing, sport hunting, and wildlife viewing appeared to be fairly low, totaling between

$450 million and $640 million per year. Some of this amount could potentially be captured within the Alaska economy through higher taxes and fees. Because subsistence protection was a primary purpose of ANILCA, I have included (Table 3) a statewide summary of subsistence activity and nutritional value.

Table 3
Alaska subsistence harvest and nutritional value, circa 1990-98

	1990 Population	Total Annual Subsistence Harvest (Pounds)	Harvest per Person (Pounds)	Percentage of Daily: Protein Reqt. (49 g/day)	Percentage of Daily: Calorie Reqt. (2400/day)	Replacement Value @ $4/lb ($ million)
Rural Participants						
Southcentral	11,014	1,688,467	153	100%	14%	6.8
Kodiak Island	13,309	2,061,607	155	101%	14%	8.2
Southeast	28,410	5,064,509	178	116%	17%	20.3
Southwest-Aleutian	13,710	5,114,522	373	242%	35%	20.5
Interior	10,383	6,359,597	613	398%	57%	25.4
Arctic	20,380	10,507,255	516	335%	48%	42.0
Western	19,447	12,918,649	664	431%	62%	51.7
Total Rural	116,653	43,714,606	375	243%	35%	174.9
Urban Participants						
Ketchikan Area	13,828	461855	33	22%	3%	1.8
Juneau Area	26,751	922,910	35	22%	3%	3.7
Matsu Area	39,415	1,056,322	27	17%	2%	4.2
Fairbanks-Delta	81,728	1,307,648	16	10%	1%	5.2
Kenai Peninsula	40,008	1,600,320	40	26%	4%	6.4
Anchorage	226,338	4,390,957	19	13%	2%	17.6
Total Urban	433,390	9,740,012	22	15%	2%	39.0
Alaska Total	550,043	53,454,618	97	63%	9%	213.8

Source: ADF&G Subsistence Division 1998.

While the numbers tallied up by Colt's study are large, they obviously cannot all be linked directly with ANILCA for several reasons. First, much of the activities take place on State lands, ANCSA lands, or non-ANILCA federal lands. If economic activity was allocated in direct proportion to acreage, then a very rough estimate of ANILCA-related jobs and income (based on 152 million conservation acres) would be 34,000 jobs and $1 billion of personal income. A more detailed allocation among land jurisdictions would be fraught with difficulty. A second problem with these numbers relates to how one defines "ANILCA lands." For example, the vast majority of Alaska tourism activity is still based on conservation lands that pre-date ANILCA, as discussed in Section 4, below. Third, the allocation of fish habitat (and

hence fishing industry jobs) among various specific land classifications is a tedious and largely meaningless exercise.

3.4. Bristol Bay wildlife refuges

In contrast to the top-down approach taken by Colt, a report by Goldsmith, Hill, and Hull (1998) focused on the economic activity associated with the Alaska Peninsula, Becharof, Izembek, and Togiak wildlife refuges. That activity can be summarized as 3,225 average annual jobs and $127 million of personal income in 1997. Commercial fishing accounted for about 90% of the jobs and income. The remaining 362 jobs were attributed to sport fishing, refuge management, subsistence-related activities, and hunting. If subsistence activity were treated as wage labor, it would equate to an additional 750 jobs, and the authors estimated that subsistence also generated more than $50 million in net economic value (as defined above).

3.5. ANILCA and tourism in southeast Alaska

One of the most detailed and thoughtful studies of the effects of ANILCA on tourism was the Masters' thesis done by Larry Bright (1985). Bright's research is noteworthy for several reasons. He attempted to measure changes in actual geographic use patterns between the mid-1970s (pre-ANILCA) and the mid-1980s (post-ANILCA). He focused directly on the "designation effect" of six Wilderness areas within the pre-existing Tongass National Forest. He collected primary data directly from tourism business operators.

Bright was very careful not to read too much into his survey results. Nonetheless, he concluded the following:

> I have come to the conclusion that designation [of Misty Fjords Wilderness] has played a significant role [in the increased use of the area]….The dramatic jump in Misty Fjords use occurred during and immediately following the designation (1980/81), while use in surrounding areas continued to grow at a much slower pace.
>
> Some of the most convincing evidence supporting the designation effect comes from the operators themselves. Every Misty Fjords operator I interviewed stated that they used its official designation promotionally. The operators offering services in 1980 told me that the designation gave them a nationally recognizable name to advertise. (p. 33)

Bright also showed a clear respect for the "necessary but not sufficient" aspect of the ANILCA designations. He identified six distinct inputs to the increased production (and

consumption!) of tourism in southeast. Designation as a special area was one (p 68). The others, in Bright's own words, were:

> 1.) access – a site must be reachable within a reasonable amount of time and by a reasonable mode of transportation….In most cases, boat or plane are the two most reasonable mechanisms of transportation.
>
> 2.) the tourists must be "reachable" – there must be an available market in which the tourism operator can "peddle the goods." If cruise ships did not stop in Ketchikan and provide a market, scenic flights of [sic] Misty Fjords would not have developed to the present day level.
>
> 3.) a single, dramatic attraction – like a large glacier (Hubbard), many glaciers (Glacier Bay), or an outstanding salmon stream (Situk).
>
> 4.) promotional skills and equipment – in many parts of Southeast boats or planes must be available to access an area. As well as the equipment, individuals must be present with the promotional skills to initiate a tourism enterprise.
>
> 5.) facilities – probably less a factor in Alaska than in other parts of the U.S. (p. 68)

In addition to this insightful analysis of the economic inputs to successful Alaska tourism, Bright's work serves as an interesting benchmark for assessing tourism growth in general and nature-based tourism in particular. For example, Bright concludes that the number of canoe and kayak visitors to Misty Fjords Monument Wilderness increased from zero during the mid 1970s to 22 in 1983. However, the number of people taking scenic overflights increased from about 300 in 1979 to about 7,000 in 1984. If nothing else, these numbers show how the same *relative* increase (about 20-fold for both kayakers and flightseers) can translate into very different overall levels of activity.

Bright's work contains several other interesting nuggets of information, but two are particularly noteworthy. The first is a content analysis of tourism advertising in the late 1970s and early 1980s. The analysis, done by Vicki Morck, randomly selected issues of 21 magazines and newspapers published between 1974 and 1984. The study appears to have addressed the entire state of Alaska, resulting in a small sample of observed advertisements that referred to Southeast. Nonetheless, the number of total referrals to six areas on the Tongass that became Wilderness through ANILCA[8] jumped from 7 during the period 1975-80 to 35 during the period

[8] Misty Fjords, Stikine/LeConte, West Chichagof, Russell Fjord, Tracy Arm, and Admiralty Island.

1981-84. Only the Tracy Arm and Admiralty Island geographic areas appeared in advertising prior to ANILCA.

The second set of noteworthy data relates to the long-run growth of tourism in Southeast. Bright cites data showing that 1,650 tourists booked passage on steamships through the Inside Passage in 1883. One hundred years later, "fifteen cruise ships were working Southeast in 1983, carrying nearly 100,000 passengers." (Bright, p 56). These data yield a very-long-run average annual growth rate of 4.2 per cent per year through 1983. Growth has since accelerated: In 2004, more than 700,000 cruise passengers passed through southeast Alaska.

4. Additional Analysis

4.1. Management and stewardship effort due to ANILCA

One indisputable effect of ANILCA has been to dramatically increase the number of federal employees engaged in the land management enterprise. The direct effects of management and stewardship consist of government agency employment and procurement expenditures. The procurement expenditures reflect the goods and services that land managers purchase in order to carry out their missions. These include travel, commodities, and a substantial amount of "contractual services" which can range from printing to consulting to heavy construction. These procurement expenditures therefore support the jobs of private sector workers. Spending by resource management agencies also has indirect and induced economic multiplier effects in addition to initial direct spending.

In fiscal year 2000 about 2,400 people (full-time equivalent) were employed in Alaska in stewardship activities by the major federal land management agencies. The associated payroll was $167 million. It is possible to make an informed estimate of the fraction of this activity that is attributable to the ANILCA additions by comparing Park Service budgets and employment with 1981 levels[9] and by assuming that half of current Fish and Wildlife Service stewardship is due to ANILCA additions. (This assumption attempts to make an implicit allowance for reduced acreage managed by the Bureau of Land Management after ANILCA.) The net effect of this admittedly rough calculation is that ANILCA additions resulted in 800 direct and 1,800 total new

[9] Quinley, John, Assistant Regional Director, NPS Alaska Region, personal communication 24 June 2005.

jobs supported by stewardship spending, with a direct additional payroll of $72 million and total additional personal income of $131 million. The details of the calculation are shown in Table 4.

Table 4
Federal stewardship jobs and expenditures related to ANILCA

	Average Annual Employmen	Payroll ($ million)	Other Expend. ($ million)	Total Expenditures ($ million)
Federal Agencies (FY2000)				
Interior Department	1,518	109	80	189
Park Service year 2000	647	34	39	73
Fish and Wildlife Service	525	55	22	77
Bureau of Land Management	347	20	19	39
Agriculture Dept. - Forest Service	792	51	53	103
Commerce Department - NMFS	102	7	67	74
Total Federal	2,412	167	199	366
Compare to:				
NPS total employees 1981	111			
NPS budget for pre-ANILCA parks (year 2004$)		5	4	9
Total NPS budget for all parks, 2004		49	43	91
Yields: Estimated stewardship spending due to ANILCA				
Park Service	535	44	38	83
Fish and Wildlife Svc (net of BLM)	262	28	11	38
Total direct	**798**	**72**	**49**	**121**
Indirect and Induced	1,045	59		
Total due to ANILCA	**1,843** (jobs)	**131** (payroll)	**49**	**180** (total exp.)

Notes to table:
(1) Forest Service employment assumed unchanged by ANILCA
(2) Net effect of additional FWS responsibilities, net of reduced BLM responsibilities, is assumed to be one half of current FWS staffing and expenditures
(3) assumes no multiplier on non-payroll spending, to compensate for out-of-state purchases. (A likely overcompensation)

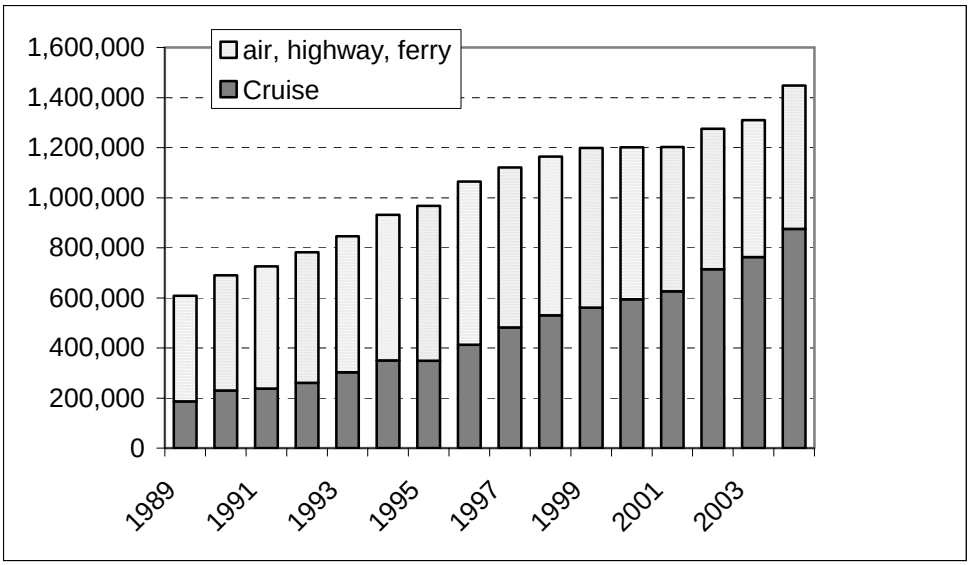
4.2. Tourism growth and ANILCA

As Figure 3 reflects, the Alaska Visitor industry is the only private sector basic industry that has grown continuously since statehood and continues to grow. That's because it is fundamentally tied to United States and worldwide population and income growth. Almost 1.5 million Visitors came to Alaska in summer 2004, and almost 90% of them[10] came primarily to see the state's mountains, glaciers, and wildlife. These summer tourist Visitors spent more than

[10] recent arrivals data to not reveal trip purpose, but the historical average fraction of summer visitors coming primarily for pleasure is about 88%.

$1 billion in Alaska during recent years, and supported about 18,000 average annual Alaska jobs[11] (Colt 2001).

Figure 3
Alaska Summer Visitor Arrivals 1989-1999, by major transport mode



Note: "cruise" includes estimates of people who fly into Alaska and cruise out.
source: Alaska Visitor Statistics Program

Ongoing research by myself and ISER colleagues confirms what many observers of tourism activity can sense directly: Current Alaska tourism activity revolves around Denali and Glacier Bay national parks. Our analysis of expenditure diaries suggests that more than half of total Alaska tourism spending is done by people who visit Denali. Visitors to Denali in summer 2001 stayed in Alaska 14 days, on average, while all other visitors spent only 8 days, on average. Denali visitors spent $2,300 per party per trip, compared with only $1,100 spent by all other visitors.

Promotional material confirms that Denali and Glacier Bay still capture the imagination of at least the cruise-oriented tourist. To take the most prominent example, the opening Alaska page on the Princess Web site begins with this statement:

> FROM THE MAJESTIC TIP OF MT. MCKINLEY to the jagged edge of Glacier Bay, Alaska is unlike any place else in the world. That's why Princess has perfected the art of Alaskan travel, from our luxurious

[11] Total Visitor spending is greater – perhaps $1.8 billion – because it also includes business and winter travel.

> cruise ships that navigate the dramatic coastline to our exclusive wilderness lodges that comfortably put you at one with nature.[12]

Overall tourism growth rates (measured over the past 15 years) have averaged about 6% per year for all summer arrivals and about 11% per year for cruise passengers. If these growth rates persist, the number of cruise passengers will double in less than 7 years, and the total number of tourists will double in less than 12 years. However, both Denali and Glacier Bay national parks are – and have been for some time – operating at or near capacity.[13] Thus a fundamental question – perhaps *the* fundamental question about tourism and ANILCA is this: What is the potential for the new ANILCA conservation units to attract Visitors, and how fast can that potential be realized?

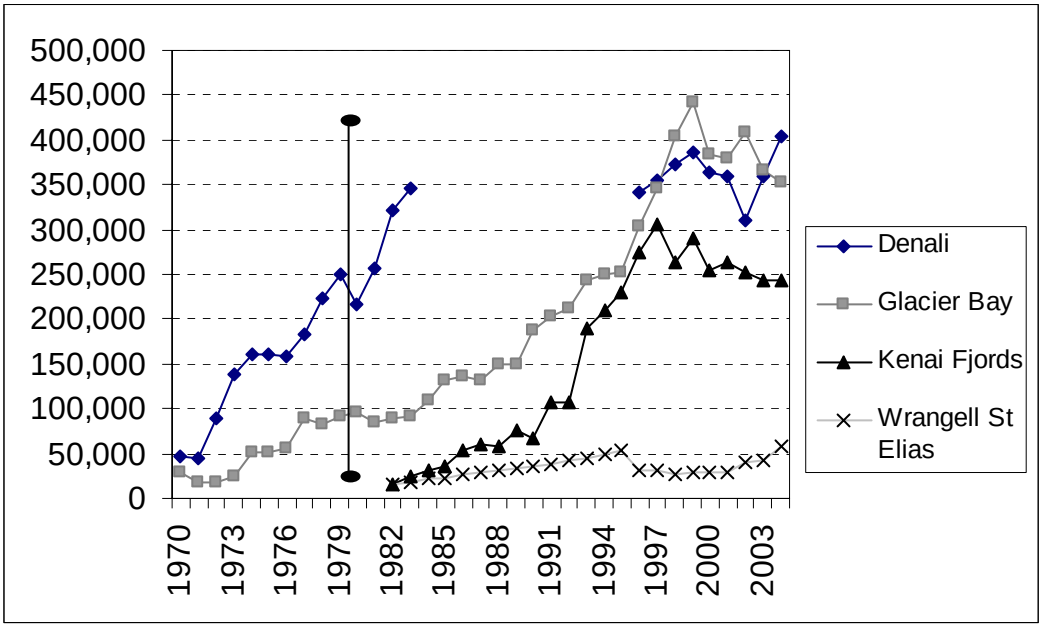
Park Service visitation data can shed some light on this issue. Figure 4 shows that visits to Denali and Glacier Bay have both increased steadily with no obvious jump due to ANILCA. (The reported data for Denali during the decade prior to 1996 is not shown, as counting methods were very inaccurate.) Denali was a pre-existing national park, while Glacier Bay was renamed by ANILCA from monument to park. Denali reached capacity some time around 1990.[14] Glacier Bay visitation reflected the rapid growth of the Alaska cruise industry during the 1980s and 1990s. It is impossible to tell whether designation as a park contributed to this growth.

[12] http://www.princess.com/destination/alaska/index.html on 4 July 2005.

[13] The capacity of Glacier Bay could be adjusted up by allowing significantly more cruise ships into the bay, but such a move would only postpone the capacity problem by a few years at current growth rates.

[14] It is likely that capacity for travel on the park road *at times and dates of peak demand* was reached many years before overall limits on travel.

Figure 4
Recreation visits to popular Alaska national parks



source: NPS visits database http://www2.nature.nps.gov/stats/

The data also show how visitation has grown at the two most popular new parks created by ANILCA. During the immediate post-ANILCA period of 1982-1984, both Kenai Fjords and Wrangell-St. Elias received about 20,000 visitors. During the ensuing two decades, however, visits to Kenai Fjords increased 12.4% per year, while visits to Wrangell-St. Elias increased at only 4.7% per year. This difference in growth rates has led to a huge difference in the number of visits: About 250,000 people now visit Kenai Fjords while only about 50,000 visit Wrangell-St. Elias. Meanwhile, the combined total of visits to the 8 other new ANILCA parks is less than 40,000.

Returning to the question posed above – the ability of the new parks to attract Visitors – I conclude that the data give cause for cautious optimism. One can interpret Figure 4 as showing successive waves of rapid growth in visitation as specific park destinations acquired more of the six inputs to the successful production of tourism enumerated by Bright. Recent public policy initiatives and private capital investments have increased the probability that Wrangell St. Elias and perhaps some of the other more remote parks will be able to attract more visitors and take some of the pressure off of Denali and/or Glacier Bay.

5. Conclusions and speculations

5.1. ANILCA and subsistence

If one takes the economic content of ANILCA section 101 seriously, then a primary *economic* goal of Congress in passing ANILCA was to preserve the subsistence economy. Although the overall subsistence question remains unresolved, particularly on state lands, it seems fair to conclude that ANILCA has, in fact, preserved the viability of subsistence as an important economic activity. As Colt (2001) and Goldsmith et al. (1998) showed, Alaskans spend about $100 million per year on cash inputs to subsistence activity. This expenditure generates almost 2,000 Alaska jobs and more than $61 million in resident income. And almost half the jobs are in the urban areas where most commercial activity takes place.

With respect to subsistence, ANILCA seems to have done a good job addressing the first two questions posed by economic theory in section 2, above. It clarified the rules of the game to establish clear subsistence rights and preferences, and it specified that subsistence could be pursued across the entire portfolio of federal lands. Whether the system will hold up over time remains to be seen. It is also not clear how or if rising energy costs may inhibit subsistence.

5.2. ANILCA and tourism

ANILCA did not directly set out to promote economic growth through tourism. The evidence presented in this paper is mixed as to whether in fact the Act provided any sort of decisive boost to Alaska's fastest growing industry. A key question – still highly relevant to policy – is whether and how the designation effect operates to boost tourism. The Kenai Fjords case study is heartening, but not conclusive. Similarly rapid growth in tourism and backcountry recreation occurred during the same time period throughout the Chugach National Forest / Prince William Sound region (Colt et al. 2002). Table 5 gives one indication of this growth from business license data. No significant redesignations occurred on the Chugach Forest from ANILCA.

Table 5
Growth in numbers of recreation-related business licenses

Region	Annual Rate of Change 1993-1998			
	Corp.	Partnersh	Sole Prop	Total
Forest	11.4%	4.1%	5.0%	5.7%
Kenai	9.1%	3.4%	0.8%	2.4%
Anchorage	2.6%	-3.1%	-3.4%	-2.0%
Matsu	8.2%	1.1%	0.3%	1.4%
Other Southcentral	3.5%	0.6%	-1.6%	-0.2%
SOUTHCENTRAL	**4.1%**	**-0.1%**	**-1.3%**	**0.0%**
Denali	15.7%	2.6%	4.9%	6.2%
Fairbanks	5.1%	-3.3%	-5.4%	-2.9%
Other Alaska	4.2%	5.7%	0.7%	2.5%
Outside Alaska	3.8%	12.5%	5.1%	5.2%
TOTAL	**4.3%**	**1.6%**	**-1.0%**	**0.6%**

note: "Forest" denotes the Chugach Forest region, including Cooper Landing, Cordova, Girdwood, Hope, Moose Pass, Seward, Tatitlek, Valdez, and Whittier.
source: Colt et al. (2002), Chapter 4

Clearly, ANILCA has not been the least bit bad for Alaska tourism during the past twenty years, and the creation of new parks is helping some regions build tourism into a vibrant industry. Some provisions of the Act, such as access to inholdings, have worked particularly well to promote high-end nature tourism. This outcome was probably fortuitous rather than intended, but it does illustrate how an attempt to respect and clarify property rights can pay unexpected economic dividends.

5.3. Limitations of ANILCA

As far-reaching as it was, ANILCA was not and cannot be a panacea for either the Alaska economy or the environment. In fact, ANILCA illustrates in several ways the limits of traditional land allocation as a method of long-term environmental conservation. The Act did not increase the physical quantity of fish, bears, or unique natural attractions. Thus, as shown above, it was not able, by itself, to ease the pressure on places like Denali. Second, ANILCA was a *land* allocation. It did not create any marine protected areas. Third, land allocations cannot protect ecosystems from airborne pollutants and contaminants, which have emerged as a major environmental concern of Arctic peoples. Finally, protected areas can do little to conserve species threatened by climate change, such as polar bears (O'Harra 2005).

As an economic stimulus to tourism, ANILCA was necessary but not sufficient. Success stories, epitomized by Kenai Fjords National Park, illustrate that many inputs are needed for

successful tourism growth. By itself, the Act could not create natural attractions, improve physical access, decrease the distance to markets, or increase the level of entrepreneurship. In the case of Kenai Fjords, some of these inputs were present prior to ANILCA, and others were created by innovative businesspeople.

5.4. Maximizing future benefits from ANILCA

Both economic theory and the evidence to date suggest that to maximize the long-term economic benefits of ANILCA, we must do three important things.

First, and most important, Alaska must protect the "Alaska difference"[15] – those fundamental attributes of the intact ecosystems that ANILCA sought to protect. This is easier said than done. For example, while ANILCA may have struck an enduring balance between mineral extraction and other uses, it did not anticipate and could not address the increasing conflicts that are emerging between tourists and locals or between motorized and non-motorized recreation. It is almost inevitable that individual residents, businesses, and visitors will seek to chip away at the integrity of Alaska's wildness. Beyond some reasonable limits, to the extent we each succeed in this endeavor it will slowly bring collective ruin.

Second, Alaskans must be patient, although not for too long. Time is on our side when it comes to extracting economic value from ANILCA resources. As discussed above, Alaska wildlands are an increasingly scarce commodity on the "supply side" of the global marketplace. In addition, the demand for nature-based tourism is growing. Under present trends, the number of people paying to visit Alaska is growing at somewhere between 5% and 10% per year. At this rate, Alaska tourism demand will double every decade. Obviously this kind of growth will require hard choices if it continues, but managing growth is preferable to managing decline.

Third, because ANILCA conservation units are just one of many required inputs to tourism, subsistence, and fish production, Alaskans must search for new ways to provide the other inputs when they are needed. These other inputs include environmentally benign physical access to ANILCA lands, more home-grown tourism business talent, and new private and public capital investment that promotes sustainable tourism or, perhaps, entirely new industries such as renewable energy production on ANILCA lands. Innovative transportation options that can bring more people into the Alaska wilderness with less environmental impact are a good place to

[15] This term appears in Bright (1985), who attributes it to Roderick Nash.

start. Cruise ships or riverboats could be powered by natural gas. Double-decker Denali buses might increase road capacity without affecting wildlife.

Looking back, ANILCA has protected subsistence, boosted tourism (to some unknowable degree) and created hundreds of direct new jobs in resource management. At the same time, several large mining projects have been developed as hoped for (Borell 2004) and more are on the way (Environmental Protection Agency 2005). Looking ahead, it is clear that Alaska's functioning ecosystems will become increasingly valuable global assets in a crowded industrialized world. If Alaska's wildlands, wildlife, and ecological integrity are cared for with respect, the contribution of ANILCA to the Alaska economy and to people everywhere will be significant, positive, increasing, and enduring.

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